

SAVE MONEY THROUGH SMART MACHINE COOLANT MANAGEMENT



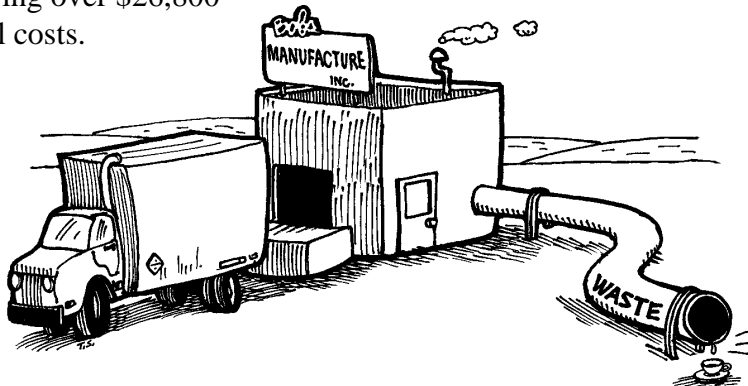
Ecology Fact Sheet

Publication #97-404

This Could Be You!

A machine shop that installed a settling tank to remove solids from coolants, and an oil separator to remove tramp oils, is now saving over \$26,800 a year in reduced material, labor, and disposal costs.

A machine shop installed oil skimmers to remove tramp oil from its machine coolants and to prolong coolant life. The coolant is now disposed once a year, rather than 3 to 6 times a year, cutting the shop's coolant disposal and purchase costs up to 83%.



A machine shop handling 20,600 gallons of coolant per year installed a chip wringer to recover excess coolant on aluminum chips. The capital investment of \$233,500 paid for itself in less than a year.

How You Can Save Money Five Ways

When machine coolants and cutting oils last longer, you can save money on:

- ✓ reduced waste disposal costs
- ✓ fewer purchases of new coolants and cutting oils
- ✓ reduced maintenance labor
- ✓ reduction in lost production time
- ✓ reduced regulatory costs



Why Do Coolants Become Unusable?

Coolants and cutting oils become unusable when they become excessively contaminated with bacteria, tramp oil, metal fines, or wastes. They can break down from use, but are most commonly broken down by bacteria growing in the system. Bacteria and fungi can cause the coolant to become rancid, lose its effectiveness, and irritate skin. The presence of wastes, tramp oils and metal fines can stimulate the growth of bacteria. The life span of most metal working coolants can be extended two or three-fold with proper management techniques.

How To Cut Your Coolant Costs

1. Coolant Selection

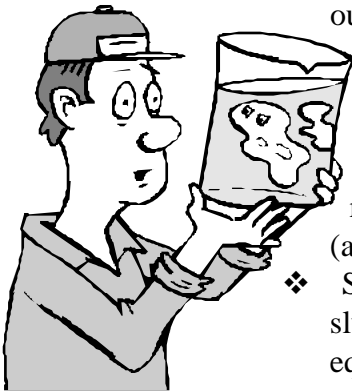
Your selection of coolant can make a big difference in the cost of maintaining your coolant system.

- ❖ Try to avoid coolants containing chlorinated compounds, they may require hazardous waste disposal in Washington State.
- ❖ Select higher quality coolants that may save you money if they last longer.
- ❖ Make sure your parts cleaning system can handle the coolant selected.
- ❖ Reduce the number of different coolants used in your shop, if possible. This can cut the cost of coolant maintenance and disposal, and permit your shop to buy in bulk.

2. Coolant Protection

Protect your coolant from spoiling.

- ❖ Train your employees to keep trash, solvents, tramp oil and other foreign material out of the coolant system. Bacteria feed on these substances.
- ❖ Use pasteurization or non-chlorinated biocides to reduce the growth of bacteria. Be aware that pasteurization cannot prevent rapid regrowth of bacteria while biocides provides continuous protection. Some businesses have found that using an aerator and diffuser rod purchased at a aquarium shop can reduce bacterial growth. The aerator is used when machines are off-line for an extended period (a weekend).
- ❖ Sanitize sumps and machinery on a regular basis. Remove all old coolant and sludges. Flush out corners. It's no use putting good coolant into bacteria-laden equipment. If necessary, retrofit sumps to make cleaning easier by lining with sheet metal or epoxy and creating rounded corners.
- ❖ Consider using de-ionized water when mixing coolant formulations. The minerals present in most water can destroy desirable coolant properties and form deposits.
- ❖ Monitor coolant quality. Know when you must add make-up or additives. Know when bacterial growth is about to get out of hand. One way to do this is by keeping records of when and how much additives or make-up coolant are added. Signs of bacterial growth should also be recorded.
- ❖ Screen out and recycle metal fines where coolant enters work station sumps or exits from holding trays.



3. Coolant Recycling

Coolant can often be recycled on-site to further extend the life of the fluid.

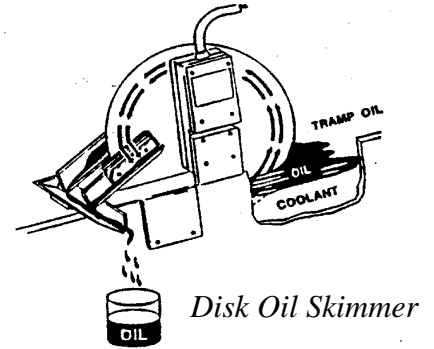
- ❖ Remove tramp oils and metal chips from the coolant system by using oil skimmers or filters, centrifuges, etc. This will discourage bacterial regrowth.
- ❖ Recapture coolant lost to cuttings, swarf, and chips.
- ❖ Send cutting oils and the oil portion of synthetic coolants to an oil recycler.

Revamp Your Coolant Management System

The following insert is a checklist to help you organize your coolant management system. You might want to make several copies and keep them by the coolant tanks. Keeping records of the coolant maintenance will insure consistency in your operation and could save you money.

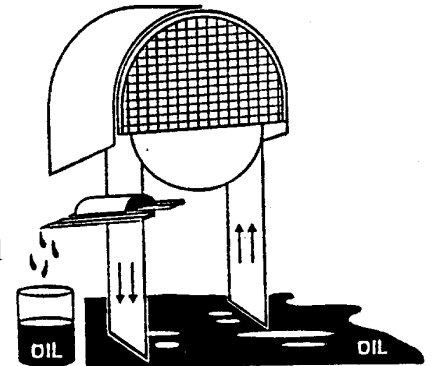
Recommended Procedure For Cleaning Coolant System

1. Pump the fluid from the sump.
2. Remove all metal chips and fines.
3. Wipe oily residues from all surfaces.
4. Fill sump with a good cleaner. Circulate the cleaner through the coolant system for a period of time.
5. Wipe or brush cleaner solution on machine surfaces. Be thorough.
6. Pump cleaning solution from sump and wipe cleaning residues from sump.
7. Rinse entire coolant system by circulating clean water through it. Wipe cleaned surfaces not contacted by rinse water, using wet cloths or sponges.
8. To reduce potential for corrosion, immediately recharge the coolant system with new or refurbished coolant.



Coolant and Cleaner Disposal

- ❖ Industrial wastes such as coolants and sump cleaners should never be disposed to a septic or storm system, or drywell.
- ❖ Oil-water emulsion coolants can often be chemically “split” to separate the oil from the water. It may be more economical for you to discharge the water to the sewer and recycle the oil portion.
- ❖ Check with your local sewer utility before you discharge **any** liquids to the sewer.
- ❖ Know whether your wastes and wastewaters are a dangerous waste. Dissolved metals, chlorinated oils, and biocides are among the ingredients that can require coolant to be disposed as a dangerous waste.
- ❖ Coolants are most economically recycled or disposed if they do not contain hazardous constituents. Avoid chlorinated oils when possible. Never mix other wastes such as solvents into coolants. Even a small amount of a federally-listed solvent can cause a whole container or tank of coolant to be a dangerous waste. Call your local Ecology office for advice.
- ❖ Processing of a dangerous waste coolant for disposal must be done in accordance with regulations for treatment by dangerous waste generators (see Ecology publication #96-412, *Treatment by Generators*).
- ❖ Regulatory requirements for recycling used coolant that is a dangerous waste are explained in Ecology publication #91-46, *Regulation of Dangerous Wastes Being Recycled*.
- ❖ The regulation of used oil that is burned is explained in Ecology’s *Used Oil Discussion Paper*, dated October, 1992.



Call your nearest Ecology office for copies of the documents listed above.

How Much Is All This Going To Cost?

The cost of changing your coolant management system must be compared with the true costs of your current system. When you count the costs of waste management and disposal, labor, down-time, material purchases, and worker safety, you may find that your current system costs more than you think. To accurately account for all the costs of your current system and any new proposals, see Ecology publication #95-400, *Cost Analysis for Pollution Prevention*.

For More Information

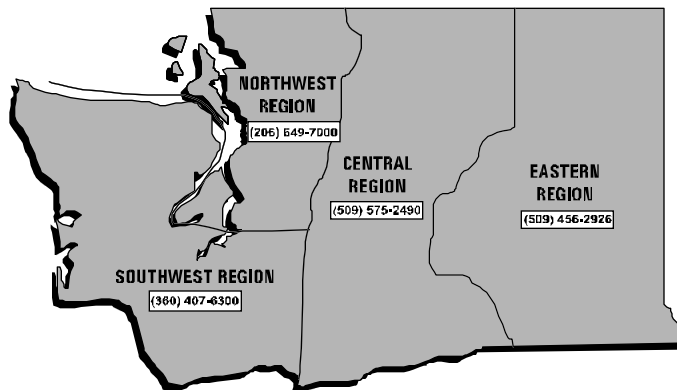
The Department of Ecology has waste reduction specialists who can answer your coolant management and waste disposal questions. They can provide free service at your site or over the phone, and maintain a large database of suppliers and services. Call the hazardous waste program at your nearest Ecology office:

Northwest Regional Office, Bellevue (206) 649-7000

Southwest Regional Office, Lacey (360) 407-6300

Central Regional Office, Yakima (509) 575-2490

Eastern Regional Office, Spokane (509) 456-2926



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If you have special accommodation needs or require this document in alternative format, please contact the Hazardous Waste and Toxics Reduction Program at (360) 407-6700 (voice) or (360) 407-6006 (TDD).

Ecology's regional TDD numbers are:

CRO (TDD) (509) 454-7673

ERO (TDD) (509) 458-2055

NWRO (TDD) (206) 649-4259

SWRO (TDD) (360) 407-6306